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Immigration Issues in Hiring Alien Physicians
A Central Division of General Internal Medicine
Impact of Ending Mandatory Retirement
Information Science and Molecular Medicine
Native Americans in Medicine
Practice Profile
Success in Medical Training
Commentary: Indians' Needs
Practice Locations of Family Practice Graduates
The Value of Community Preceptorships in Surgery
Physicians' Attitudes toward "Laying on of Hands"
AAMC Data Report: Minorities and Residency Match

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A Practice Profile of Native American Physicians

TIMOTHY L. TAYLOR, M.P.H., Ph.D.

Abstract—Native American physicians constitute less than 0.5% of the overall U.S. physician supply. Little is known about their professional practices in terms of location, specialty, practice setting, and amount of time allocated to professional activities. The Association of American Indian Physicians, AAIP, is a professional organization of physicians, each of whom is at least one-eighth American Indian. A survey of its 109 members in 1987 elicited 84 responses. The findings indicate that most respondents were American Indians to less than one-quarter degree, and although they were practicing in locations where large numbers of Indian people reside, 65% reported that less than 25% of their direct patient care activity involved Indian patients. In regard to Native American physicians, the survey findings and other published information contradict the view that minority medical practitioners are more likely than their white counterparts to practice in areas where large numbers of their respective minority populations reside and will, therefore, provide medical care to significant numbers of their respective minority populations. *Acad. Med.* 64(1989) 393–396.

Information about the number of Native American physicians* and the locations and types of their practice settings is incomplete. The primary sources of information about minority health manpower are government reports, which are often based on U.S. Bureau of the Census estimates. These and other reports generally conclude that minority practitioners provide a great deal of medical care to numbers of their minority populations.[1-3] Such reports, however, are replete with disclaimers about their data, especially when it pertains to Native American health professionals. These disclaimers reflect the surprisingly low representation of Native American people in the major health professions. According to the Census of 1980, Native Americans made up less than 1% of the total U.S. population, and less than 0.5% of the total U.S. population of physicians. This available information about Native American physicians is based on sample estimates. Hence, the large sampling error associated with small numbers—such as those that represent the Native American population and the population of Native American physicians—and the effects of even small numerical differences on the ratios and percentages computed by the Census Bureau, make drawing conclusions about Native American physicians particularly risky.[1]

Nevertheless, the Census Bureau has reported there were 510 civilian Native American physicians employed in 1980. As late as 1978 and 1979, published "guesstimates" of the total number of Native American physicians were between 125 and 175.[4,5] According to information produced by the Association of American Medical Colleges, during the period 1969 through 1980 there have been 222 Native American graduates of U.S. Schools of Medicine.[6]

It was also reported by the Census Bureau[1] that Native American physicians were located in the South and West. Although the West and the South Central area of the South are areas of the country where significant numbers of Indian† people reside, there are important differences between the distribution of Native American physicians and that of the Indian population. For example, the Census Bureau reported that "Indian physicians were not as likely as the Indian population to locate in the Mountain Division of the West, but were nearly two to three times more likely than the population to reside in the South Atlantic, East South Central, and Middle Atlantic Divisions." Yet, "even in the Middle Atlantic Division, where Indian physicians were three times more likely to reside than the Indian population, the number of

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*Medical education and medical care of American Indians are considered from various points of view in this issue. In addition to this article, see the Commentary, "Native Americans in Medicine: The Need for Indian Healers," (page 388); the article, "Predicting and Fostering Success of American Indians in Medical School" (page 396); and the Data Report (page 418).

†In this paper, the terms "Native American," "American Indian," and "Indian" are used interchangeably.

Indian physicians per 100,000 Indian population was only 94, as compared with 230 white physicians per 100,000 white population in that Division. In most other geographic areas, the ratio of Indian physicians to the Indian population was substantially below the ratio observed in the Middle Atlantic Division."[1]

An additional caveat about Census Bureau information concerns the self-identification process used by respondents to Census Bureau surveys. The Native American population is the only American minority group for which blood quantum levels must be established for tribal membership (for most federally recognized Indian tribes) and for federal benefits, such as higher education grants from the Bureau of Indian Affairs. (Blood quantum level refers to the degree of "Indian blood" an individual may possess as a result of parents who are not "full-blood Indians," or when only one parent is Indian, or when the parents are from different tribes.) Although the Census of 1980 reported the total Indian population to be 1.4 million, almost 7 million Americans claim American Indian ancestry.[7] Reasonable concern exists about the blood quantum levels and tribal membership levels of the 510 Native American physicians estimated to practice in the U.S., as well as recent Native American graduates of U.S. medical schools.

The difficulties associated with conducting a comprehensive survey of Native American physicians are immense. The only organization in the United States that routinely gathers and updates information about Native American physicians is the Association of American Indian Physicians, AAIP. Established by a group of prominent Native American physicians in 1971, AAIP has focused its activities primarily on the recruitment, admission, and retention of Native American medical students. The present report is based on a survey of 84 Native American physicians who are members of AAIP. Because a relatively small number of physicians were surveyed, the results of the study may not be viewed as representative of the total population of Native American physicians; nevertheless, these findings help to fill an important information gap.

Method

In late 1986, a postcard questionnaire was sent to 124 members of the AAIP to verify mailing addresses. At the same time the president of the AAIP sent personal letters to the members announcing the survey and requesting their participation. The mailing addresses of 109 AAIP members were confirmed by returned postcard.

Shortly thereafter, a six-page questionnaire was sent to each of the 109 AAIP members who had responded to the postcard questionnaire. Most of the six-page questionnaires were returned during the late summer and autumn of 1987; a total of 84 (77%) were received. Although most AAIP members returned their questionnaires, not all members responded to every question. Thus, not all the findings are based on responses from the same number of physicians.

The questionnaire was composed of two parts. Part I dealt with aspects of professional practice, such as location, licensure, specialty, practice setting, and amount of time allocated to professional activities. Respondents were also asked to indicate the proportion of their direct patient care time devoted to Medicare (or Medicaid) and Native American patients. Part II dealt with issues and problems related to medical education and training and to establishing a practice. In addition, descriptive information, such as age, gender, and Indian blood quantum level, was also requested. This report describes the findings of Part I of the survey, which provided a practice profile of the Native American physicians who responded.

Findings

The average age of respondents was about 42 years; men outnumbered women 68 to 16. Fifty percent of the respondents were less than one-quarter Indian; five respondents were "full-blood" Native Americans. Most respondents were located in the U.S. West and South, particularly in the Pacific Division of the West and the South Central Division of the South. Specifically, there were 19 respondents located in the Pacific and West South Central census divisions; 12 located in the Mountain Division; 11 located in the South Atlantic Division; 10 located in the West North Central Division; 4 located in each of the East North Central, Mid-Atlantic, and New England Divisions, and one located in the East South Central Division.‡ Almost 40% of the respondents were family practitioners, followed by surgeons (18%), those who indicated medical specialties (16%), and psychiatrists (11%). Of those who responded, the largest proportion were in private practice (25%). Fifteen respondents (21%) reported their employment position to be that of staff physician, 13 (18%) were residents, 13 others were medical or clinical directors, eight (11%) were medical school faculty, and five respondents indicated other employment positions.

Forty-four of 70 respondents reported they allocated over 40 hours per week to direct patient care. Eighteen respondents reported they allocated more than 60 hours per week to direct patient-care activities. Almost half (47%) of the responding physicians indicated that 25% or less of their direct patient care time involved Medicare or Medicaid patients. Thirty-two percent of the respondents reported they allocated more than 25%, but less than 50%, of their direct patient care time to Medicare or Medicaid patients. Almost 21% of the respondents reported they allocated more than 50% of their direct patient care time to Medicare or Medicaid patients.

‡States are assigned to census regions in the following way: Pacific: Alaska, California, Hawaii, Oregon, Washington; Mountain: Wyoming; West North Central: Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota: West South Central: Arkansas, Louisiana, Oklahoma, Texas; East North Central: Illinois, Indiana, Michigan, Ohio, Wisconsin; East South Central: Alabama, Kentucky, Mississippi, Tennessee; South Atlantic: District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia; Mid-Atlantic: Delaware, New Jersey, New York, Pennsylvania; New England: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont.

In terms of the delivery of health care to Native American patients, 85% of the respondents reported that 25% or less of their direct patient care time involved Native American patients. Six respondents (11%) indicated that between 25% and 75% of their direct patient care time was allocated to Native American patients. Eleven respondents reported all their patients were Native Americans.

Table 1 presents an overview of these findings.

Discussion

Since this practice profile of Native American physicians is based on survey information that is not representative of all Native American physicians, statistical analyses to compare findings with characteristics of other groups of physicians would be inappropriate. However, the findings of the survey reported here may be placed in better perspective if described within the context of similar published information about other groupings of physicians, Native American physicians, and the professional activities of all these groups. For example, 19% of the respondents to the survey of Native American physicians were women. This does not appear to be an accurate reflection of the actual distribution of Native American men and women in the medical profession. In 1972, 1978, and 1984, women were 24%, 27%, and 37% of the total native American enrollment in all U.S. medical schools, respectively. In 1984, women were over 50% of the total first-year Native American enrollment in all U.S. medical schools.[8]

According to 1980 Census Bureau information, there were 35 Native American physicians per 100,000 Native American population. This compares to 50 black, 129 Hispanic, and 198 white physicians per 100,000 members of the black, Hispanic, and white populations, respectively.

In terms of the location of Native American physicians by census region, most are located in the Northeast Region (80 per 100,000 Native Americans), particularly in the Mid-Atlantic Division (94 per 100,000). The concentration of Native American physicians in this census division does not support the view, cited at the beginning of this paper, that minority physicians, in this case Native American physicians, practice in locations where large numbers of Native Americans reside. According to census information, two regions that have large numbers of Native Americans, the West Region and the North Central Region (especially the West North Central Division) have the lowest numbers of Native American physicians (25 and 27 per 100,000, respectively). Many Native American physicians (80 per 100,000) appear to reside in the East South Central Division of the South Region, composed of Alabama, Kentucky, Mississippi, and Tennessee, yet only 1.5% of all U.S. Native Americans reside in these four states. On the other hand, 25.6% of all Native Americans reside in the Mountain Division of the West Region, were there are 12 Native American physicians per 100,000 Native Americans.

According to the survey findings of the AAIP membership reported here, most respondents were located in the Pacific, West South Central, Mountain, South Atlantic, and West North Central Census Divisions. Seventy-one of 84 respondents (84.5%) were located in these census divisions, where 85% of the total U.S. Indian population reside. In the Pacific and West South Central Census Division of the U.S., where 25% and 16% of the Native American population live,

Table 1

Profile Characteristics of Native American Physicians, the Association of American Indian Physicians, 1986–1987*

Characteristic	No. of Respondents
Specialty area ($n = 84$)	
Family medicine	32
Surgical specialties	15
Medical specialties	14
Psychiatric specialties	9
Pediatrics	5
Obstetrics/gynecology	3
Hospital-based specialties†	3
General practitioner	2
Other specialties	1
Type of practice or position ($n = 72$)	
Private practice	18
Staff physician	15
Resident	13
Medical/clinical director	13
Faculty	8
Other	5
Hours in average week allocated to direct patient care ($n = 70$)	
20 or less	10
21 to 40	16
41 to 60	26
61 to 80	9
More than 80	9
Percentage of direct patient care allocated to Native American patients ($n = 54$)	
25 or less	35
26 to 50	4
51 to 75	2
76 to 100	13

*Results of a survey of 109 members of the Association; 84 members replied. Not all findings are based on responses from the same number of physicians, because some physicians did not respond to certain questions.

†Includes anesthesiology, pathology, and diagnostic and therapeutic radiology.

respectively, 38 (45%) of the respondents practice.

Of 73 respondents, 18 indicated they were in private practice. Seventy-five percent of the respondents were in salaried positions. Nationally, in 1985 almost 26% of all physicians were employees of organizations.[9]

In 1985, self-employed physicians averaged 52.6 hours per week in their patient care activities; employee physicians averaged 46.6 hours per week.[9] Respondents to the present survey averaged 52.47 hours per week in their patient care activities. Over 25% indicated they averaged over 60 hours per week in their patient care activities.

In a 1985 study, all U.S. physicians reported that 35.2% of their patient care visits were made by Medicare patients.[9] Respondents who participated in the present survey reported 18.2% of their patient care visits were made by Medicare or Medicaid patients, and 11 respondents (20.7%) reported over 50% of their patient care time was allocated to Medicare or Medicaid patients.

Perhaps the most revealing aspect of the practice profile of AAIP physicians is their response to the question asking them to report the percentage of direct patient care delivery time they allocated to Native American patients. Thirty-five of the 54 physicians responding (65%) reported they allocated 25% or less of their direct patient care delivery time to the delivery of health care to Indian patients. Eleven of the respondents (20.3%) indicated 100% of their patients were Native Americans.

As noted earlier, government reports have indicated that Native American physicians are not distributed in locations where large concentrations of Indian people reside, and given the relatively small size of the overall Native American population, they probably do not have many Indian patients. The survey findings of AAIP members seem to support this general conclusion. It is most important to note that these findings regarding Native American physicians do not, however, support the widely held view that physicians "from each racial/ethnic minority group [are] much more likely than white practitioners to reside in areas in which significant percentages of their respective population group [reside]."[1] Since certain aspects of many Native American tribal cultures impede access to and/or delivery of modern medical care services, it is as important, if not more important, for Native American physicians to practice among Native Americans as it is for black and Hispanic physicians to practice among blacks and Hispanics, respectively. Moreover, in spite of the fact that there are so few Native American physicians, this discussion begs the question, "Why aren't more Native American physicians providing medical care to their own people?" This is a suitable question upon which to base additional study.

The author acknowledges the generous assistance of Mr. Terrence Hunter, Executive Director of the Association of American Indian Physicians, without whose support and cooperation this Indian physician practice profile could not have been completed.

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Predicting and Fostering Success of American Indians in Medical School

LYNN A. KERBESHIAN, Ed.D.

Abstract—Underrepresentation of minorities continues to be a significant problem for medical schools. Although schools are considering nontraditional selection factors in an attempt to redress imbalances in admissions, little is known about the criteria that predict success for minority students who enroll. American Indian medical students at the University of North Dakota School of Medicine were surveyed concerning quantitative and qualitative variables. They scored significantly lower than non-Indian students, but there was no difference in terms of traditional admissions criteria between the Indian students who withdrew and those who graduated. Students who withdrew were slightly younger, had more siblings, and had attended reservation schools. Problems noted by students included poor academic preparation, excessive family responsibilities, and encountering cultural misperceptions. An overview of these problems and recommendations for solving them are presented. *Acad. Med.* 64(1989):396–400.

highly visible. There is pressure on the student and the faculty to get students through to meet somewhat arbitrary graduation and residency deadlines. If more students were taking decelerated or optional enrichment programs, this pressure would not be so great.

Special programs for minority students need to be individually designed, with a variety of options within the group framework. Easing some of the everyday hassles and burdens that can become overwhelming when students are stressed and pushed to their limits can be invaluable. Such efforts would include helping with finances, recreation, spouses, children, and extended family. Having someone available to talk to about problems—personal concerns, prejudice, and attitudinal changes—can be a great help, according to the students interviewed.

Minority programs can model successful integration with aspects of the majority culture, for example, mixing with faculty, using other services within the community, and establishing contacts with the health professions organizations in the state. A coordinated effort by students, faculty, administration, and the program, using all available resources, is most likely to meet long-range and immediate goals for helping medical students from Indian and other minority groups to become physicians.

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Practice Locations of Texas Family Practice Residency Graduates, 1979–1987

DAVID R. DENTON, Ph.D., JOHN H. COBB, and WILLIAM A. WEBB, Ed.D.

Abstract—The location of a physician's residency training is known to be a factor in selection of a practice location. In this paper, the authors analyze the practice locations of 689 family physicians who graduated from residency programs in Texas between 1979 and 1987 and who were practicing in Texas in 1988. One-third of these graduates were practicing in cities the same size as their residency program city. More than half were in counties located within 60 miles of the residency city. Both of these trends can be explained to a large degree by the fact that a high percentage of graduates remained in their residency city to practice. When these nonmobile graduates are removed from the sample, the findings show no correlation between the size of the residency city and the size of the practice city. More than two-thirds of those graduates who left their residency city were in counties beyond a 60-mile radius. Almost two-thirds were practicing in communities of less than 25,000 population. The authors conclude that state support for family practice residency training has been effective in distributing family physicians in a manner that addresses the needs of the state of Texas as a whole. *Acad. Med.* 64(1969):400–405.

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The literature on factors affecting physicians' practice location decisions has expanded dramatically in recent years. A wide range of factors, from opportunities for partnerships to career opportunities for nonphysician spouses, have been found to influence selection of a practice location.[1] In general, however, two principal factors have been found to correlate consistently with practice location—the nature of the community in which the physician was reared[2–11] and the nature of the community in which the physician's residency was completed.[1,2,11–15] In addition, a number of authors have found evidence that family practitioners are more likely than are members of other specialties to locate in nonme-

tropolitan areas.[5,15,16]

In 1978, in response to growing shortages of physicians in rural areas of Texas and with the strong support of the Texas Academy of Family Physicians, the Texas state legislature established the Texas Family Practice Residency Training Program. Through this program, state funds were provided to help support family practice residency programs at a level that consistently has averaged 15–20% of each program's operating costs. The objectives of the program were twofold — to replenish the dwindling supply of general and family practitioners in Texas and to improve the distribution of primary care physicians in the state, especially in the extensive, often sparsely populated, rural areas. From 13 programs with a total of 267 residents in 1978, the Texas Family Practice Residency Training Program has grown to include 25 programs and 479 residents in 1989. All family practice residency programs operating in the state receive state funding. Family practice is the only area of specialty training for which this is the case. The Texas Higher Education Coordinating Board (CB) is responsible for administering the family practice residency grants.

In order to provide the state legislature with information regarding the success of the family practice program in accomplishing its goals, staff of the CB developed a computerized system for tracking program graduates. Because this is a state program designed specifically to address the needs of Texas, the focus of the tracking system has been on graduates practicing or licensed to practice in Texas. The system does not include information about the personal backgrounds of family practice graduates; historical information for each graduate goes back only as far as identification of the medical school. Nevertheless, the tracking system is sufficiently comprehensive, and the number of graduates to date sufficiently large, that an analysis of practice locations can provide meaningful information to assess the wisdom of the legislature in choosing to support family practice residency training as its foremost strategy for addressing problems of geographic maldistribution.

Method

The tracking system for graduates of Texas family practice residency programs is based on the data-base model of the Texas State Board of Medical Examiners (BME). The CB file on each graduate of a state-supported family practice residency program includes that person's Texas medical license number, Social Security number, mailing and practice addresses, sex, first and second specialties, medical school, year of graduation, type of degree (M.D. or D.O.), primary activity, and setting (reflecting only federal employment or enrollment in a further residency or fellowship program). In addition to these items maintained for licensure purposes, the file identifies the graduate's family practice residency program, the year it was completed, the Texas county of practice, and a code categorizing the size of the practice city.

Files on individual graduates are first compiled in the fall of each year on the basis of information provided by each residency program for its current graduates. While this information is often incomplete, it includes certain key variables — most notably name, Social Security number, medical school and year — that permit subsequent matching with licensure data with a high degree of accuracy. The file is updated each spring with a master file provided by the BME. Special programs are run to match key variables for graduates not identified on the initial match by their Texas license numbers. Reports also are generated indicating any changes in other information for matching license numbers. The CB elements are then manually updated on the basis of changed BME data, especially regarding practice county and city. Since Texas physicians renew their licenses annually on a staggered schedule throughout the calendar year, the BME data include some obvious margins for error. It is conceivable, for example, that a physician could renew 11 months prior to the updating of the CB file and move a month later. The updated address would then be ten months out of date. At one time, efforts were made to correct for such slippage by asking each residency program to verify information on their graduates. Unfortunately, the quality of information about their graduates maintained by residency programs varies from exceedingly accurate to largely accidental. As a result, we decided that the BME data, checked and corrected for obvious inconsistencies such as misspellings of personal or place names, represented the most statistically defensible information available for graduates practicing in Texas. Information obtained from individual residency programs is used to update only the files of graduates who have not renewed their Texas medical licenses within the past year.

For purposes of the present study of practice location decisions, we determined that only those graduates meeting the following specific criteria would be included.

The sample was limited to physicians who had completed their family practice residency training between 1979 — the year of the first class of residents supported by state funds — and 1987 — the most recent class at the time of this study whose members' CB files were updated against BME data.

The particular concern of this study was with graduates who had made a voluntary decision to practice medicine in a location in Texas (as opposed to a military or public health service assignment in the state). Therefore, we included only those graduates who reported that their practice addresses were in Texas, that their primary activity was either direct patient care or medical teaching, and that family practice was their first specialty, and who did not report that their settings were in federal facilities or that they were students in other residency programs or fellowships. (We regarded the decision to accept a faculty appointment in a Texas family practice residency pro-

gram as a voluntary practice decision, since at least part of such faculty members' time is spent providing care to patients who are Texas residents. We recognized that adding this group of graduates would create a slight tendency to include more graduates practicing in larger metropolitan areas. The exclusion of those reporting that they were in other residency programs or fellowships may have left out some 1987 graduates who last renewed their licenses prior to completing their family practice residencies, even though they might have decided subsequently to enter practice in Texas.)

For those graduates meeting the established criteria, we used information on the CB files regarding the city and county of practice and the location of the residency program to determine the numbers of graduates practicing in the city where their residency program was located. We also identified those practicing in the county of their residency program but outside the residency city and those in counties located within 60 miles of the residency city. These counties were identified by drawing a circle with a scale radius of 60 miles from the center of the residency program city as indicated on an easily available Texas road map. Any county with its nearest border within or tangential to the resulting circle was regarded as being within 60 miles of the residency city. This means that some graduates were included in the 60-mile category whose practice locations were in fact much farther than 60 miles from the residency program city. (The maximum distance possible in this situation was 110 miles).

We also used the data regarding the size of the practice city to determine the numbers of graduates practicing in Texas cities in each of the seven population size categories represented in the CB files. (Populations were based on 1980 census data. More current population data might be expected to have the effect of moving additional cities toward the upper and lower extremes of the range. The seven size categories used were arbitrarily determined at the time the data base was created, to reflect generally accepted in-state perceptions of groupings of Texas cities by size).

Finally, we looked at both proximity to residency and size of practice city again, using a reduced sample that excluded graduates practicing in the city of their residency program. The purpose of these tests was to evaluate practice-location patterns for those graduates who overcame the attraction of the city where they completed their training and elected to move elsewhere in Texas. We recognized that this distinction might be compromised by graduates locating in suburban areas around the residency city, but we also recognized that many of the residency cities are located in counties that contain distinctly rural communities.

Results

Between 1979 and 1987, Texas family practice residency programs produced a total of 1,033 graduates. Of that number, 689 (66.7%) met the criteria for inclusion in this study of graduates practicing in Texas.

Among these 689 graduates practicing in Texas, nearly one-third (30.9%) were found to be practicing in the city where they had completed their residency. Only 3.3% of this sample had moved to another city of comparable size to practice. Almost two-thirds (67.7%) of the graduates were practicing in cities that were not the same size as the cities of their residency programs. Testing for geographic proximity to the residency program city, we found that more than half (53.1%) of the sample were either in the residency city (30.9%) or in counties within 60 miles of that city (22.2%). When graduates remaining in the residency city were removed from the sample, only 12.2% of the remaining graduates were practicing in the county of their residency program. Twenty percent were in other counties within 60 miles of the residency city, while more than two-thirds (67.9%) had moved to counties beyond the 60-mile radius.

Looking at the distribution of the 689 graduates by size of city of practice shows that an impressive one in four (24.2%) were located in communities of less than 10,000 population, while another 19.7% were located in communities between 10,000 and 24,999 (Table 1). The next-largest group (18.3%) had located in cities of 500,000 and over, with 14.7% in cities between 200,000 and 499,999. None of the three city-size categories between 25,000 and 199,999 attracted as much as 10% of the sample.

When graduates practicing in the residency program city are removed from the sample, the distribution of graduates shifts downward significantly toward smaller communities. In the new sample, the percentages of graduates located in each of the four larger city-size categories are smaller, while those in the three categories of cities under 50,000 are larger. In this sample of graduates leaving the resi-

Table 1

Numbers and Percentages of 689 Graduates of Texas Family Practice Residency Programs between 1979 and 1987, Listed by the Population Size of the Texas City in Which They Were Practicing in 1988, and Numbers and Percentages of the 476 Graduates in This Group Not Practicing in the City of Their Residency Program

Size of Practice City	All Graduates in Practice in Texas		Graduates in Texas Not in Residency City	
	No.	Percent	No.	Percent
Under 10,000	167	24.2	167	35.1
10,000–24,999	136	19.7	135	28.4
25,000–49,999	38	5.5	38	8.0
50,000–99,999	66	9.6	36	7.6
100,000–199,999	55	8.0	24	5.0
200,000–499,999	101	14.7	33	6.9
500,000 and over	126	18.3	43	9.0
Total	689	100.0	476	100.0

Table 2

Numbers and Percentages of 689 Graduates of Texas Family Practice Residency Programs between 1979 and 1987, Listed by the Population Size of the Texas City in Which They Were Practicing in 1988 and the Population Size of the City in Which Their Residency Was Located

Size of Practice City	Size and Number of Residency Program Cities									
	10,000–24,999 ($n = 1$)		50,000–99,999 ($n = 7$)		100,000–199,999 ($n = 3$)		200,000–499,999 ($n = 5$)		500,000 and over ($n = 6$)	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Under 10,000	2	33.3	30	24.6	39	30.7	58	26.7	38	17.5
10,000–24,999	1	16.7	22	18.0	23	18.1	49	22.6	41	18.9
25,000–49,999	0	—	8	6.6	8	6.3	11	5.1	11	5.1
50,000–99,999	0	—	36	29.5	12	9.4	5	2.3	13	6.0
100,000–199,999	0	—	3	2.5	33	26.0	5	2.3	14	6.5
200,000–499,999	1	16.7	7	5.7	5	3.9	77	35.5	11	5.1
500,000 and over	2	33.3	16	13.1	7	5.5	12	5.5	89	41.0
Total	6	100.0	122	100.0	127	100.0	217	100.0	217	100.0
Total in Texas city same size as residency city	1	16.7	30	24.6	31	24.4	68	31.3	83	38.2

dency program city to practice elsewhere in Texas, 35.1% were located in cities under 10,000, 63.5% in cities under 25,000.

With a single exception, all of the residency programs included in this study are located in cities of 50,000 or more. Our data show that more graduates of these programs have located in cities in the same city-size category as the residency city than in any other city-size category (Table 2). The percentages of graduates in same-size cities range from 26% for those programs in cities between 100,000 and 199,999 to 41% for those in cities of 500,000 and over. The one program located in a city of less than 50,000 had too few graduates at the time of the study to provide meaningful data.

When we remove the graduates practicing in the residency city from our sample, these distribution percentages change dramatically (Table 3). For residency programs in every city-size category, more of the graduates who left their residency city located their practices in communities of under 10,000 than located in any other city-size category. The minimum percentage of these mobile graduates practicing in communities of less than 10,000 was 28.4% (for graduates of programs in the largest cities); the maximum was 40.6% (for graduates of programs in cities of 100,000–199,999). In every residency city-size category with meaningful numbers of graduates, well over half of all graduates leaving the residency city have located in communities of less than 25,000 (from a low of 56.5% of graduates of programs in cities of 50,000–99,999 to a high of 71.8% of those from programs in cities between 200,000 and 499,999).

The number of graduates who have chosen to practice in another city of the same size as the city where their residency program was located was

Table 3

Numbers and Percentages of 476 Graduates of Texas Family Practice Residency Programs between 1979 and 1987 Who in 1988 Were Not Practicing in the City of Their Residency Program, Listed by the Population Size of the Texas City in Which They Were Practicing and the Population Size of the City in Which Their Residency Program Was Located

Size of Practice City	Size and Number of Residency Program Cities									
	10,000–24,999 ($n = 1$)		50,000–99,999 ($n = 7$)		100,000–199,999 ($n = 3$)		200,000–499,999 ($n = 5$)		500,000 and over ($n = 6$)	
	No.	Percent	No.	Percent	No.	percent	No.	Percent	No.	Percent
Under 10,000	2	40.0	30	32.6	39	40.6	58	38.9	38	28.4
10,000–24,999	0	—	22	23.9	23	24.0	49	32.9	41	30.6
25,000–49,999	0	—	8	8.7	8	8.3	11	7.4	11	8.2
50,000–99,999	0	—	6	6.5	12	12.5	5	3.4	13	9.7
100,000–199,999	0	—	3	3.3	2	2.1	5	3.4	14	10.4
200,000–499,999	1	20.0	7	7.6	5	5.2	9	6.0	11	8.2
500,000 and over	2	40.0	16	17.4	7	7.3	12	8.1	6	4.5
Total	5	100.0	92	100.0	96	100.0	149	100.0	134	100.0
Total in Texas city same size as residency city	0	—	6	6.5	2	2.1	9	6.0	6	4.5

not significant. The maximum falling into this category is 6.5% of the graduates whose programs were in cities between 50,000–99,999.

Discussion

When the 689 graduates of Texas family practice residency programs (1979–1987) practicing in Texas are viewed as a whole, their selection of practice locations tends to bear out several previously noted trends. In 1988, a majority of these graduates were practicing in relatively close proximity to their residency city. Fifty-three percent were in counties within 60 miles of the residency city. A large proportion of the graduates—34.3% overall—were in cities the same size as their residency program city.

The tendency of graduates of family practice residency programs (or, for that matter, many other types of educational programs) to resist change and stay in the place where they finished their training might best be called the "inertia factor." When we corrected for this inertia factor by eliminating from our study the graduates who stayed in their residency city, the correlation between the size of the residency city and the size of the practice city disappeared. What emerged instead is an extremely strong tendency for family practice residency graduates to locate in communities that are generally much smaller than the ones where they completed their residency. Less than 5% of these mobile graduates chose to move to a city the same size as their residency city. Moreover, the trend to smaller communities cannot be explained to any significant extent by the numbers of graduates who located in smaller suburbs of their residency city, since only 12% of this group did in fact move from the residency city out into the same county.

Of particular interest in these data is the tendency for family physicians not to locate in the large middle range of cities between 25,000 and 199,999. Only 23.1% of all the graduates studied located in these cities, even though such cities offer a large number of choices, are widely perceived as being among the most "liveable" cities, and include within their boundaries 10 of the 22 residency programs that produced the graduates included in this study.

We believe these results have important implications for Texas and for decision makers in other states as they attempt to grapple with the problem of geographic maldistribution of physicians. They also raise questions not easily answered in the context of our available data.

First, it is clear, regardless of how the data are arranged, that state support for family practice residency programs has had the desired effect of moving large numbers of family practitioners out into the smaller communities that have suffered most from the increasing concentration of physicians in larger metropolitan areas. Even if we make the highly questionable assumption that most graduates outside their residency city but in the same county are in communities of less than 25,000 and then remove these from our calculations, still more than one-third of all the remaining graduates practicing in Texas and more than half of those leaving the residency county were practicing in cities of under 25,000 at the time of this study.

The questions arise when we look at the lower but still significant proportion of graduates practicing in larger cities and metropolitan areas—33% of all the graduates in Texas are in cities of 200,000 or more. On one hand, this tendency of the majority of graduates to locate in either the largest or the smallest communities in the state can be seen as desirable. The largest cities are more likely than those in the midrange to include census tracts designated as shortage areas for primary care physicians. Family physicians may well be more likely to serve such underserved urban areas than are members of other primary care specialties. Unfortunately, our existing data base does not allow us to match the locations of graduates practicing in urban areas with census tracts, so we cannot be certain that these urban family physicians are actually serving the shortage areas to any significant extent.

If, in fact, we were able to conclude that the number of graduates remaining in these large urban areas outstrips the need for new family physicians in these areas, we would then be faced with the dilemma of how to overcome the inertia factor. Every city in this 200,000-plus category has at least one residency program, and, as our findings show, the overwhelming majority of the graduates practicing in each of these cities were products of one of the city's own programs. Unfortunately, we do not have data that will tell us whether the graduates staying in their residency cities are products of urban backgrounds and those in smaller communities of rural backgrounds. Thus, we cannot know whether selective recruitment would alter the distribution pattern. There is a significant body of literature, however, that suggests strongly that this might be the case.[2-11]

It seems probable in any case, given the demographics of the U.S. population and the fact that a high percentage of graduates already are going into more rural areas, that a substantial number of those staying in their residency city are and will continue to be from nonrural backgrounds. If we determine that we do need to encourage more of this less mobile group of graduates to leave and establish practices in rural areas, some other strategy besides selective recruitment may be required. One option might be the development of a systematic method for providing all residents with significant experience in nonmetropolitan areas. Such a system of remote rural training sites might conceivably be built around the existing Texas Statewide Family Practice Preceptorship program, which currently involves almost 500 private practice family physicians in the state and reaches more than 500 preclinical and clinical medical students each year, and which is funded through the Texas Family Practice Residency Training Program. The logistics of any such program would clearly be complex and costly and are well beyond the scope of this paper.

In discussing these questions of whether to, or how we might, encourage more residents to overcome the

inertia factor and move to smaller communities to practice, there is a further issue that must be considered that is essentially political. That is, state funds provide no more than about 20% of the total budget of Texas family practice residency programs. The largest proportion of funding for these programs—60% of the average program's operating budget—comes from local sources, including both direct and in-kind support from affiliated hospitals and public hospital districts, local foundations, and, in the case of programs affiliated with medical schools, locally generated medical school funds. Yet, while providing more than half of the financial support to the programs, the metropolitan areas where they are located are getting back a much smaller proportion of program graduates. It might thus be argued that the midsize and larger cities where all but one of the Texas residency programs are located are already augmenting the state support that helps provide family practitioners in rural and smaller urban areas. This argument does not take into consideration, however, the large volume of medical services that the residency programs themselves provide directly to the midsize and larger communities in which they are located. Although this combination of services provided by the programs and graduates retained by the communities would be quite difficult to quantify, they may add up to a rough equilibrium between local support and local benefit. Viewed from that perspective, it might well be argued that the current distribution pattern of family practice residency graduates in Texas is almost optimal to adequately address the needs of the state as a whole for family physicians.

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The Educational Value of Community Preceptorships in Surgery

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Abstract—Increasing class size provided the impetus to send students on the core surgery course at the Medical University of South Carolina College of Medicine into the community hospitals with members of the clinical faculty. Each student was assigned to a surgeon and accompanied this preceptor on rounds, in the operating room, and in the office. To determine whether the students' learning was affected by being outside the university, the authors looked at the experience from 1977 to 1986 with 683 surgery students who took community preceptorships and 696 surgery students who took only university-based rotations. The two groups were compared in regard to age, sex, basic science grade-point average, class rank at the end of the first two years in medical school, ward evaluations, grades on departmental final examinations, and National Board of Medical Examiners "mini-examination" scores and Part II surgery scores. No differences were found. Choices of specialty for the first postgraduate year and evaluations of program directors were reviewed for 1982, 1985, and 1986, and were similar for all three years. The preceptorship program has been popular with students, who stated that they valued the one-to-one relationship with surgeons who liked to teach. The program has relieved pressure on the university hospital system and provided a good learning experience for students. *Acad. Med.* 64(1989):405-407.